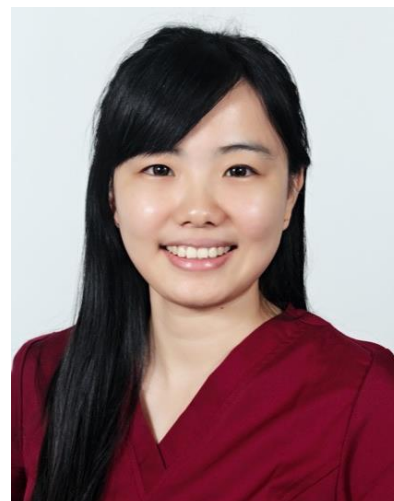


Research Aid Award

Dr. Xianrui Yang, University of Michigan

Biography

Dr. Xianrui Yang is currently a second-year orthodontic resident at the University of Michigan School of Dentistry. Born and raised in China, she obtained her D.D.S., M.S.D, and Ph.D. from the West China School of Stomatology, Sichuan University *summa cum laude*, and conducted research in both basic science and clinical orthodontics. In the first year of her Ph.D., Dr. Yang went to Harvard School of Dental Medicine for her research in extracellular biology and intracellular signaling mechanism in the Department of Developmental Biology. She then continued her postdoctoral research fellowship at Harvard University. She has 23 patents and has published 40 scientific articles with more than 1000 citations. Dr. Yang's research interest for the M.S. of her orthodontic residency focuses on regulating human bone marrow stromal cells' (hBMSCs') osteogenic differentiation for bone regeneration.



Brief Project Description

Orthodontic tooth movement is sometimes limited by alveolar bone defects, which can be treated through bone regeneration. Similarly, craniofacial bone defects which result from various disorders and trauma can also be treated through bone regeneration. BMSCs, combined with biomaterials and growth factors, are often used to induce the bone regeneration process. FGF-2 (Fibroblast growth factor-2) is a growth factor that is implicated in angiogenesis and promotes greater osteoblast differentiation when administered in critical-sized calvaria bone defects. It also plays a key role in regulating bone marrow stem/progenitor cell pluripotency through the FGFR (Fibroblast growth factor receptor) signaling pathway. FGF2/FGFR signaling has crosstalk with multiple pathways such as WNT, TGF- β , and Hippo signaling. The Hippo pathway is activated by the transcriptional co-activator YAP (Yes-associated protein) and TAZ (WW domain-containing transcription regulator), which are phosphorylated and inactivated by LATS1/2 (large tumor suppressor 1/2). Prior research showed that FGFR signaling affects YAP by inhibiting LATS during tumorigenesis. However, it's not clear whether FGF2/FGFR regulates Hippo/YAP signaling pathway through LATS1/2 for bone marrow stem/progenitor cell differentiation in the bone regeneration process. This project will further explore the regulation mechanism between FGF2/FGFR signaling and the Hippo/YAP signaling pathway during craniofacial bone regeneration. Results of this study will help clinicians to better treat patients with craniofacial or alveolar bone defects in the future.

Significance of AAOF Support

Dr. Xianrui Yang is dedicated to making significant contributions to the field of orthodontics as a clinician and scientist. This AAOF Research Aid Award further inspired her professional passion and provides essential resources for studying the regulation mechanism in osteogenic differentiation of bone marrow stem cells for craniofacial bone regeneration. Dr. Yang is extremely grateful to receive this award from the AAOF, which will also support her future academic career.